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Redistributive Effects of a Change in the Inflation Target



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Abstract

In light of the financial crisis and its aftermath, several economists have argued that inflation-targeting central banks should reconsider the level of their inflation targets. While the appropriate level for the inflation target remains an open question, it's important to note that any transition to a new target would entail certain costs. In this note, we consider one dimension of these costs, namely, the redistributive effects stemming from the fact that financial contracts are often written in nominal terms and would thus experience changes in real value following the announcement of a new target. We use Canadian data on the distribution of nominal assets and liabilities to predict the redistribution of wealth that would occur following a permanent 1-percentage-point increase in the rate of inflation, both across sectors and between various demographic cohorts. We find that this change would trigger a large redistribution of wealth from the household sector to government, mainly through a reduction in the real value of government bonds and unindexed pensions. However, losses are unevenly distributed across the household sector, with a disproportionate share falling on middle-class and wealthier households. We also use a macro model to explore potential implications for output and find that these depend critically on the particular use to which the government directs its windfall.

Bank topics: Inflation targets; Monetary policy framework

JEL code(s): E52, E58

Résumé

À la lumière de la crise financière et de ses répercussions, plusieurs économistes ont soutenu que les banques centrales appliquant un régime de ciblage de l'inflation devraient revoir le niveau de leur cible d'inflation. Même si le niveau optimal reste à déterminer, il importe de noter que toute transition vers une nouvelle cible comporterait certains coûts. Dans cette étude, nous nous penchons sur l'un des aspects de ces coûts, à savoir les effets de redistribution liés au fait que les contrats financiers sont souvent libellés en termes nominaux et verraient du coup leur valeur réelle changer à la suite de l'annonce de la nouvelle cible. Nous nous servons de données canadiennes sur la distribution des actifs et des passifs nominaux pour prédire la redistribution de la richesse – tant entre secteurs qu'entre cohortes démographiques – qui découlerait d'une hausse permanente de un point de pourcentage du taux d'inflation. Nous observons qu'un tel redressement engendrerait une redistribution importante de la richesse du secteur des ménages vers celui des administrations publiques, principalement par la réduction de la valeur réelle des obligations d'État et des pensions non indexées. Les pertes ne sont toutefois pas réparties également dans le secteur des ménages, une part disproportionnée étant supportée par les ménages de classe moyenne et ceux plus fortunés. Nous utilisons également un modèle macroéconomique afin d'évaluer les conséquences possibles pour la production et constatons que ces dernières dépendent fortement de l'utilisation que l'État ferait de ces gains inattendus.

Sujet(s) : Cibles en matière d'inflation; Cadre de la politique monétaire

Code(s) JEL : E52, E58

1. Introduction and Main Findings

In light of the financial crisis and its aftermath, several economists have argued that inflation-targeting central banks should reconsider the level of their inflation targets.¹ For example, Ball (2014) argues that recent experience with the effective lower bound warrants an inflation target of 4 per cent, well outside the range that most central banks currently target. While the appropriate level for the inflation target remains an open question, it's important to note that any transition to a new target would entail certain costs. In this note, we consider one dimension of these costs, namely, the redistributive effects stemming from the fact that financial contracts are often written in nominal terms and would thus experience changes in real value following the announcement of a new target.² We estimate these redistributive effects using methods developed by Meh and Terajima (2011) and Meh, Ríos-Rull, and Terajima (2010). More specifically, we use Canadian data on the distribution of nominal assets and liabilities to predict the redistribution of wealth that would occur following a permanent 1-percentage-point increase in the rate of inflation, both across sectors and among various demographic cohorts. We also use a macro model to explore the implications for future output.

The main findings are as follows:

1. A 1-percentage-point increase in the rate of inflation, if permanent and unanticipated, would trigger a large redistribution of wealth from the household sector to government. The household sector's losses are estimated to total about 4.3 per cent of annual GDP, while the government would experience a 4.2 per cent gain. This redistribution occurs mostly through a reduction in the real value of government bonds and unindexed pensions,³ which are especially sensitive to long-term inflation due to their maturity.
2. Losses are unevenly distributed across the household sector, with a disproportionate share falling on middle-class and wealthier households. Middle-class households in the 46–55 age bracket are especially affected, with losses totalling 2.7 per cent of their net worth, mainly through unindexed pensions. Overall, nearly three-quarters of households would suffer net losses, and almost half would experience losses totalling 1 per cent or more of their net worth.
3. Results from the macro model suggest that the output effects of the aforementioned redistributions depend on the particular use to which the government directs its windfall.

¹ See Ball (2014); Blanchard, Dell'Ariccia and Mauro (2010); and Williams (2009), among others.

² To be precise, the relevant channel operates as follows. When a nominal contract is first written, agents have certain expectations for future inflation. If shocks subsequently cause those expectations to change, then the contract's real value changes as well. In particular, higher inflation would imply a transfer of real wealth from creditors to debtors, since it reduces the real value of the promises that the former have made to the latter. In the case of a permanent increase in the rate of inflation, the magnitude of this effect depends on the maturity of the underlying contract. This is because the gap between agents' pre- and post-shock expectations on the price level at maturity is wider for longer-lived contracts.

³ In Canada, non-indexed defined-benefit plans account for a large share of all pensions. For example, in Statistics Canada's 2005 Survey of Financial Security, non-indexed defined benefit plans accounted for 57 per cent of households' overall pension holdings.

2. Redistribution of Wealth Across Sectors

To shed light on the redistributive effects of inflation, we analyze data on the distribution of nominal claims in Canada. **Table 1** shows net nominal positions (i.e., nominal assets – nominal liabilities) for various sectors, computed as a percentage of GDP using 2012Q1 data from the National Balance Sheet Accounts. Following Meh and Terajima, the data are broken down among three sectors: household, government and foreign. (Firms’ assets and liabilities have been distributed to each of these three sectors in proportion to those sectors’ equity holdings, so there is no need to include corporates as a fourth sector).⁴ The data have also been broken down across four asset categories: short-term, long-term, mortgage and pension. The category distinctions are important because assets with longer maturities are more sensitive to permanent changes in the rate of inflation than those with shorter maturities.

As shown in **Table 1**, the household and foreign sectors are both net nominal savers, with households’ nominal savings concentrated in long-term assets and unindexed pensions. On the other hand, the government sector is a net nominal borrower, with nominal debt concentrated in long-term bonds. As a result, a permanent increase in the rate of inflation should trigger a redistribution from households to government. This redistribution is quantified in **Table 2**, which gives the change in the real value of each sector’s net position following a shift from 2 to 3 per cent inflation, assuming that the shift is permanent and unanticipated. It is important to note that this experiment is different from those conducted in Meh and Terajima and Meh et al., which focus on the redistributive effects of unanticipated *but temporary* increases in inflation. Under our permanent-increase scenario, the household sector experiences a loss equal to 4.3 per cent of GDP, while the government sector experiences a 4.2 per cent gain. The foreign sector also experiences a small 0.2 per cent gain.

3. Redistribution of Wealth Inside the Household Sector

To get a sense of how the household sector’s losses are distributed across various age and socio-economic brackets, we supplement the analysis above with data from the Statistics Canada 2005 Survey of Financial Security. Based on the nominal assets and liabilities that households reported in that year, **Table 3** gives the gains or losses that various household groups would experience under a shift from 2 to 3 per cent inflation, computed as a percentage of each group’s initial net worth.⁵ Young, poor households emerge as net winners, while older and/or wealthier households tend to bear the brunt of the sector’s losses. Middle-aged, middle-class households are especially affected, with losses reaching up to 2.7 per cent of net worth in the 46–55 age bracket. These substantial losses occur because middle-class households have more of their wealth tied up in pensions and fixed-income products, while rich households own disproportionately more equity.

Given this heterogeneity in the household sector, it is natural to ask how many households would ultimately emerge as net losers. **Figure 1** provides a histogram for households’ losses as a percentage of their initial net worth. We see that most households would suffer net losses. More specifically, 74 per cent of all households (10.8 million) would experience net losses, with 47 per cent (6.7 million) losing more than 1 per cent of their initial net worth. In contrast, only 21 per cent of households (3.1 million) would experience a gain greater than 1 per cent of their initial net worth.

⁴ See McGrattan and Prescott (2005).

⁵ For a given age bracket, “rich” households are those in the top 10 per cent of the wealth distribution. The other 90 per cent are then divided on the basis of income, with the bottom 20 per cent labelled “poor” and the remainder labelled “middle class.”

4. Implications for Output

We use the overlapping-generations model in Meh et al. to calculate how the above-noted changes in the distribution of wealth might affect output. Each generation in the model exhibits a life cycle, together with some heterogeneity in labour productivity, so the model can be calibrated to capture heterogeneity across age and socio-economic brackets.

When calibrated to 2005 data (as in Meh et al.) and fed a set of shocks consistent with the redistributions described above, the model suggests that the overall impact on output hinges critically on how the government uses its windfall. **Table 4** describes the economy's output path under various fiscal policies. The top row focuses on the case where the government transfers its windfall to retirees and thus takes no steps to mitigate the losses experienced by working-age households. These households are then incentivized to work more, leading to an increase in cumulative output over 40 years equal to 4.0 per cent of steady-state GDP.⁶ If the government instead uses its windfall to reduce labour taxes, then this wealth effect is reinforced by an increase in the effective wage, leading to a 7.4 per cent increase in cumulative output. On the other hand, if the government opts for a lump-sum transfer, treating all households equally, then most of the intersectoral redistributions described above are undone in terms of their implications for output and the results are instead driven by compositional effects inside the household sector, together with the relatively small changes occurring in the foreign sector. This leads to a modest 0.5 per cent reduction in cumulative output.

5. Concluding Remarks

Unanticipated inflation affects the wealth distribution because many agents hold nominal contracts, the real value of which changes with inflation. Using methods developed by Meh and Terajima (2011) and Meh, Ríos-Rull and Terajima (2010), we find that a 1-percentage-point increase in the rate of inflation, if permanent and unanticipated, would effect significant changes in the distribution of wealth. More specifically, it would trigger a large transfer from the household sector to government, although the losses of the former sector are unevenly distributed across age and socio-economic brackets. In particular, young, poor households emerge as beneficiaries due to their net borrower status, while older and/or wealthier households experience net losses because of their large bond and pension holdings.⁷ Overall, nearly three-quarters of households (10.8 million) would suffer net losses, and almost half (6.7 million households) would experience losses totalling 1 per cent or more of their initial net worth.

Before closing, we note that these results are likely insensitive to the assumption that the shift to the new rate of inflation occurs immediately, rather than being pre-announced and then implemented with an interim transition period, assuming that this period lasts about as long as the transition witnessed when the Bank of Canada introduced its current target in the early 1990s. This is because our results are mainly driven by agents' exposure to long-term instruments on which prices would adjust very quickly following any announcement. We also note two additional channels through which the shift to a higher inflation target might influence the distribution of resources in the economy. First, the distribution of income, as distinct from wealth, might be affected to the extent that wages fail to adjust, especially for low-skilled workers with less bargaining power.⁸ Second, a higher target could trigger losses for banks, with potential implications for

⁶ Although GDP increases due to higher labour supply, the average welfare of households declines.

⁷ These conclusions are broadly consistent with those found for other countries, including the United States (Doepke and Schneider 2006) and the euro area (Adam and Zhu 2015).

⁸ Coibion et al. (2017) study detailed micro-level data and explore various channels through which monetary policy affects income inequality.

financial stability and the ability of banks to support real activity, namely because the nominal items on banks' balance sheets tend to exhibit a mismatch between long-term assets and short-term liabilities.⁹

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⁹ For example, Cao (2015) shows that nominal instruments account for more than 70 per cent of the assets and liabilities of US commercial banks, with a 5-year mismatch in average maturity. Using a methodology very similar to that in Meh and Terajima (2011), she then estimates that a 1-percentage-point increase in US inflation, if permanent and unanticipated, would trigger an average loss equal to 10–15 per cent of Tier 1 capital.

Table 1: Net Nominal Positions (Assets – Liabilities) as a Percentage of GDP
(based on 2012Q1 data from the National Balance Sheet Accounts)

Sectors	Short-term	Long-term	Mortgage	Pension	Overall
Household	8.5	27.0	-13.6	17.3	39.3
Foreign	-0.7	10.8	10.8	-9.1	11.7
Government	-7.8	-37.8	2.8	-8.2	-51.0

Table 2: Redistribution of Wealth as Percentage of GDP after a 1-Percentage-Point Increase in Inflation from 2 to 3 Per Cent

(based on 2012Q1 data from the National Balance Sheet Accounts)

Sectors	Short-term	Long-term	Mortgage	Pension	Overall
Household	-0.08	-2.13	0.45	-2.55	-4.32
Foreign	0.01	-0.85	-0.36	1.35	0.15
Government	0.08	2.98	-0.09	1.21	4.17

Table 3: Redistribution of Wealth as Percentage of Net Worth for Various Age and Socio- economic Brackets
(based on 2005 data from the Survey of Financial Security)

Ages	Poor	Middle-Class	Rich
< = 35	0.96	1.27	-0.63
36–45	1.14	-1.10	-0.03
46–55	-0.21	-2.69	-0.61
56–65	-0.35	-1.85	-0.04
66–75	-0.13	-1.18	-0.57
> 75	-0.43	-0.74	-0.65

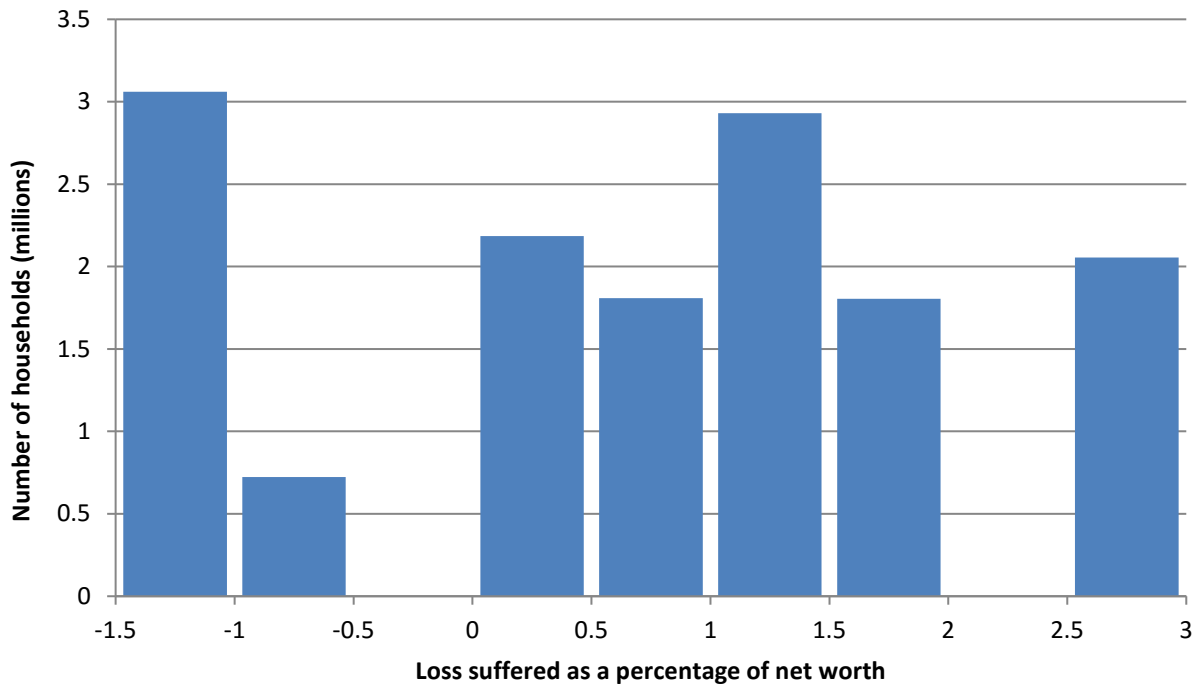
Table 4: Output Effects from a 1-Percentage-Point Increase in Inflation

(computed using the model in Meh et al. (2010), calibrated to 2005 data and fed with shocks consistent with the redistributions described in Tables 1–3)

Government transfers	1st Decade	2nd Decade	3rd Decade	Cumulative
Transfers to retirees only	0.232	0.167	0.050	4.043
Labour tax decrease	0.581	0.272	0.020	7.434
Uniform lump-sum transfers	0.077	0.023	-0.058	-0.525

Note: The middle three columns give the average yearly deviation from steady-state output in a particular decade, expressed as a percentage of steady-state output. The right-most column gives the cumulative deviation over 40 years, expressed as a percentage of steady-state output.

Figure 1: Distribution of Household Losses



Households experiencing a net loss: 10.8m (74%)
Households experiencing a net loss greater than or equal to 1% of net worth: 6.7m (47%)
Households experiencing a net gain greater than or equal to 1% of net worth: 3.1m (21%)

Note: The distribution of household losses has been computed using data from Statistics Canada's 2012 Survey of Financial Security to assign population weights to each of the cells in Table 3.